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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/009,539

Applicant(s)

WEINER, HELMUT

Examiner

James A. Thompson

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2007 and 23 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 39-92 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION***Response to Arguments***

1. Applicant's arguments, see page 12, filed 23 April 2007, with respect to the rejections under 35 USC §101 have been fully considered and are persuasive. Said arguments have also rendered Applicant's arguments with regard to the rejections under 35 USC §101 on page 12 of the response filed 12 April 2007 moot. The rejections under 35 USC §101 set forth in items 3-4 of the previous office action, mailed 12 January 2007, have been withdrawn.

2. Applicant's arguments filed 12 April 2007 have been fully considered but they are not persuasive. Both Clouthier (USPN 5,949,964) and Knox (USPN 5,649,073) are concerned with the analysis and processing of digital image data that is to be printed, which is also a concern of the present application. Transmitting of image raster data of pages including transmitting said characteristic data of the marked tiles for printing of the image raster data is taught by Clouthier [see column 4, line 57 to column 5, line 14 of Clouthier], as set forth in the previous action [see, e.g., page 4, lines 8-12 of said previous office action, although cite is altered in present action due to amendment to claim]. What Clouthier lacks is a specific aspect of said transmission, namely that said transmitting is performed without transmitting image raster data of said marked tiles having gray scale values of a predetermined model dither cell. Knox is relied upon for this particular detail of the transmitting operation. Not only is said detail taught in Knox, but a motivation is present which would have motivated one of ordinary skill in the art at the time of the invention to modify the teachings of Clouthier with respect to the transmitting according to the teachings found in Knox. Specifically, said motivation is that, by modifying Clouthier such that transmitting said raster image data occurs without transmitting the image raster data of said marked tiles having gray scale values of a predetermined model dither cells, an automatic correction/calibration using a single set of characterization data, rather than using the sets of image data [see column 2, lines 39-41 of Knox], is provided for, thus improving speed and efficiency.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at

the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 39-46, 51, 53-56, 58-61, 70, 72, 75-77, 79-83 and 85-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451) and Knox (US Patent 5,649,073).**

Regarding claim 39: Clouthier discloses a method comprising: generating a data stream of image raster data page-by-page (column 4, lines 9-14 of Clouthier) from language elements of a graphics language (column 3, lines 29-32 of Clouthier), said data stream containing gray image areas in a form of dither cells (column 4, lines 2-8 of Clouthier); dividing said image raster data of each one of said pages into tiles of a two-dimensional grid (figure 1(14) and column 3, lines 28-32 of Clouthier), each of said tiles including a plurality of said image raster data (column 5, lines 6-12 of Clouthier); identifying ones of said tiles that contain only dither cells (column 5, lines 40-47 of Clouthier), and marking said tiles that contain only dither cells to produce marked tiles (column 5, lines 6-12 of Clouthier); identifying position data (column 6, line 63 to column 7, line 1 of Clouthier) and gray scale values (column 6, lines 12-17 of Clouthier) and corresponding dither cells for said marked tiles as characterizing data for said marked tiles (column 5, lines 6-12 and column 6, lines 63-65 of Clouthier); and transmitting said image raster data of pages including transmitting said characteristic data of the marked tiles for printing of the image raster data (column 4, line 57 to column 5, line 14 of Clouthier). The tiles correspond to the sections of image data that are classified in one of four possible ways (column 4, lines 2-8 of Clouthier).

Clouthier does not disclose expressly that the gray scale values of said dither cells correspond to model dither cells; that said identified tiles contain only dither cells; and that said transmitting is performed without transmitting image raster data of said marked tiles having gray scale values of a predetermined model dither cell.

Spaulding discloses that the gray scale values of dither cells correspond to model dither cells (figure 11(116A-C) and column 14, lines 32-39 of Spaulding); and identifying a model dither cell and a gray scale value thereof for each tile of dither cells (column 14, lines 36-45 of Spaulding).

Clouthier and Spaulding are combinable because they are from the same field of endeavor, namely selective processing, control and output of digital color image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the model dither cells to set the dither cells of each corresponding gray scale value for each tile of dithered image data, as taught by Spaulding, wherein said dither cells are the dither cells of the tiles specifically determined and marked by the system taught by Clouthier. The motivation for doing so would have been reduce image artifacts

Art Unit: 2625

by using already optimized model dither cells stored in LUTs for dithering the image data (column 3, lines 28-35 of Spaulding). Further, it would have been readily recognized by one of ordinary skill in the art at the time of the invention that using already optimized dither cells stored in LUTs decreases the overall processing time required. Therefore, it would have been obvious to combine Spaulding with Clouthier.

Clouthier in view of Spaulding does not disclose expressly that said transmitting is performed without transmitting image raster data of said marked tiles having gray scale values of a predetermined model dither cell.

Knox discloses transmitting characteristic data without transmitting image raster data (figure 6A (“MODEL PARAMETERS”); figure 6B (“EXPECTED TRC”); column 5, lines 20-30; and column 8, lines 3-11 of Knox). The characteristic data of the scanned image is determined and used to calibrate the printer. Only the characteristic data, such as the model parameters and tone reproduction curve (TRC), are transmitted in calibration mode. The image raster data itself is not transmitted.

Clouthier in view of Spaulding is combinable with Knox because they are from the same field of endeavor, namely the correction of digital image data. Furthermore, Knox is concerned with the same problem solving area as the present application, namely the correction of image data in an efficient manner, without require the transmission of the actual image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to correct image data by transmitting only the characteristic data needed to perform the correction/calibration, as taught by Knox, instead of the image raster data of said marked tiles taught by Clouthier. The motivation for doing so would have been to provide for an automatic correction/calibration using a single set of characterization data, rather than using the sets of image data (column 2, lines 39-41 of Knox), thus improving speed and efficiency. Therefore it would have been obvious to combine Knox with Spaulding in view of Clouthier to obtain the invention as specified in claim 39.

Regarding claim 40: Clouthier discloses that said dither cells include picture elements that are arranged one of rectangularly and quadratically (figure 2b(52,54,56) and column 8, lines 60-62 of Clouthier); and that each dither cell with a higher gray scale value at least contains inked picture elements at same positions as a dither cell with a next-lower gray scale value (column 6, lines 33-37 of Clouthier).

Regarding claim 41: Clouthier discloses checking each of said tiles to see whether said tiles contain dither cells of a type of said model dither cell with a lowest gray scale value (column 6, lines 39-46 of Clouthier). Each dither cell that is within a tile is checked to see if the dither cell is of the lowest gray scale value, the lowest gray scale value being checked first (column 6, lines 39-46 of Clouthier).

Regarding claim 42: Clouthier discloses checking tiles row by tile row; and further comprising the step of investigating a first row of dither cells of each tile before investigating subsequent rows of dither cells of the tile (column 6, lines 36-43 of Clouthier); and, given a lack of coincidence, the appertaining tile is investigated no further (column 6, lines 39-46 of Clouthier). The tiles are all arranged in a logically tiled manner across the entire image space (column 6, lines 36-43 of Clouthier), which would thus include the first tile of the first row (first row of dither cells of each tile). The tiles would inherently be checked row-by-row since the fast scanning direction would be considered the row of the image data.

Regarding claim 43: Clouthier in view of Spaulding discloses determining said model dither cell with a highest gray scale value that is contained in all dither cells of a tile (figure 2a(50) and column 7, lines 47-50 of Clouthier) for the tile that contains dither cells of a type of said model dither cell with said lowest gray scale value (column 7, lines 39-41 of Clouthier), said model dither cell with the highest gray scale value that is contained in all dither cells of the tile being said predetermined model dither cell (column 7, lines 45-50 of Clouthier); and assigning a gray scale value of said model dither cell to said tile (column 7, lines 45-50 of Clouthier). By increasing the bucket level for a tile of dither cells in the case that a dither cell has a higher gray scale value (column 7, lines 45-50 of Clouthier), the gray scale value of the highest gray scale value dither cell is assigned to said tile. Thus, when there is a model dither cell with said lowest gray scale value and a model dither cell with said highest gray scale value in a single tile, the tile will be assigned the highest gray scale value. As discussed above in the arguments regarding claim 39, Spaulding discloses that the gray scale values of dither cells correspond to model dither cells (figure 11(116A-C) and column 14, lines 32-39 of Spaulding). Thus, the combination of Clouthier in view of Spaulding teaches the specific limitations recited in claim 43.

Regarding claim 44: Clouthier discloses that said tiles have a uniform row length (n times the number of bits per pixel cell) (column 6, lines 33-35 of Clouthier).

Regarding claim 45: Clouthier discloses that said uniform row length corresponds to a bit length of a register of a hardware module (figure 2b(52,54,56: depending on supercell size) of Clouthier) with which the present method is implemented (column 7, lines 60-65 of Clouthier). The bit length corresponding to said uniform row length is determined by the particular register used, which depends upon the final bucket value (column 7, lines 60-65 of Clouthier).

Regarding claim 46: Clouthier discloses that said uniform length amounts to one of 8, 16, 32, 64 and 128 bits or an additive combination thereof (figure 2a(48) and column 6, lines 16-21 of Clouthier).

Regarding claim 51: Clouthier discloses combining neighboring ones of said tiles having a prescribed gray scale value corresponding to one of said model dither cells to form a polygon (figure 2a (48) and column 6, line 63 to column 7, line 3 of Clouthier); identifying said characteristic data of said polygon (column 6, lines 63-67 of Clouthier – corresponding bucket); and transmitting said characteristic data of said polygon for further processing of said image raster data (figure 2b and column 8, lines 25-35 of Clouthier).

Clouthier in view of Spaulding does not disclose expressly that said transmitting is performed instead of transmitting raster data of said polygon.

Knox discloses transmitting characteristic data without transmitting raster data (figure 6A (“MODEL PARAMETERS”); figure 6B(“EXPECTED TRC”); column 5, lines 20-30; and column 8, lines 3-11 of Knox). The characteristic data of the scanned image is determined and used to calibrate the printer. Only the characteristic data, such as the model parameters and tone reproduction curve (TRC), are transmitted in calibration mode. The image raster data itself is not transmitted.

Clouthier in view of Spaulding is combinable with Knox because they are from the same field of endeavor, namely the correction of digital image data. Furthermore, Knox is concerned with the same problem solving area as the present application, namely the correction of image data, such as the polygon taught by Clouthier, in an efficient manner, without require the transmission of the actual image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to correct image data by transmitting only the characteristic data needed to perform the required processing, as taught by Knox. The motivation for doing so would have been to provide for an automatic processing using a single set of characterization data, rather than using the sets of image data (column 2, lines 39-41 of Knox), thus improving speed and efficiency. Therefore it would have been obvious to combine Knox with Spaulding in view of Clouthier to obtain the invention as specified in claim 51.

Regarding claim 53: Clouthier discloses that said polygon is one of a square and a rectangle (figure 2b(52,54,56) and column 8, lines 12-17 of Clouthier).

Regarding claim 54: Clouthier discloses that said combining step combines said tiles to form a rectangle (figure 2b(52,54,56) of Clouthier) having a common minimal gray scale value (column 6, lines 63-67 and column 7, lines 39-44 of Clouthier); and wherein said transmitting step transmits said characteristic data of said rectangle (figure 2b and column 8, lines 25-35 of Clouthier).

Regarding claim 55: Clouthier discloses that said rectangle contains a sub-rectangle (column 8, lines 12-17 of Clouthier) whose tiles have a minimum gray scale value that is higher than a gray scale value of the tiles of said rectangle (figure 2a(48) and column 7, lines 45-50 of Clouthier). The individual

Art Unit: 2625

elements of the rectangle (column 8, lines 12-17 of Clouthier) increase the bucket value of the overall rectangle, thus resulting in the tiles of the sub-rectangle having a minimum gray scale value higher than a gray scale value of said rectangle (figure 2a(48) and column 7, lines 45-50 of Clouthier).

Regarding claim 56: Clouthier discloses producing a list of said rectangles (column 8, lines 25-30 of Clouthier); and transmitting said characteristic data of said list (column 8, lines 34-35 of Clouthier).

Regarding claim 58: Clouthier discloses organizing said list such that rectangles with a descending number of tiles assume a descending rank in the list (column 8, lines 12-16 of Clouthier); and transmitting only those rectangles from said list whose number of tiles exceeds a predetermined value for further processing (column 8, lines 30-35 of Clouthier). The list of selectable supercells is organized such that the smallest supercell has the smallest rank and the largest supercell has the largest rank (column 8, lines 12-16 of Clouthier). If the data type requires the selection of the largest supercell, then the largest supercell is output (column 8, lines 30-35 of Clouthier).

Regarding claim 59: Clouthier discloses limiting a number of rectangles of said list to a predetermined value (column 8, lines 16-24 of Clouthier). The number of rectangles is limited by setting the rectangle size based on the capabilities of the printer to be used (column 8, lines 16-24 of Clouthier).

Regarding claim 60: Clouthier discloses expanding boundaries of said rectangles by incorporating into said rectangles any dither cells of one of a row and of a sequence that adjoin a corresponding rectangle (column 6, lines 50-57 of Clouthier) and that have a same minimum gray scale value as said dither cells of said corresponding rectangle so as to form expanded rectangles (column 6, lines 63-67 of Clouthier).

Regarding claim 61: Clouthier discloses determining a position of an upper left corner (column 7, lines 12-15 of Clouthier), a height, a width (column 6, lines 33-35 of Clouthier), and a gray scale value for each of said rectangles (column 6, lines 63-67 of Clouthier) with reference to said pages as said characteristic data (column 6, lines 33-39 of Clouthier); and transmitting said characteristic data (figure 2b and column 8, lines 25-35 of Clouthier). A position for each pixel is determined (column 7, lines 12-15 of Clouthier), thus including the pixel at the upper left corner of the rectangle.

Regarding claim 70: Clouthier discloses generating a data stream of image raster data page-by-page (column 4, lines 9-14 of Clouthier) from language elements of the graphics language (column 3, lines 29-32 of Clouthier) using a RIP module (figure 1(16) of Clouthier).

Regarding claim 72: Clouthier discloses transmitting said raster data as print raster data to a printer (figure 1(28) and column 4, lines 52-56 of Clouthier).

Regarding claims 75, 85 and 87: Clouthier discloses a system (figure 1(12) and column 2, line 66 to column 3, line 2 of Clouthier) comprising a RIP module (figure 1(16) of Clouthier) that generates a data stream of image raster data page-by-page (column 4, lines 9-14 of Clouthier) from language elements of a graphics language (column 3, lines 29-32 of Clouthier), said data stream containing gray image areas in a form of dither cells (column 4, lines 2-8 of Clouthier); a two-dimensional grid network (figure 1(14) and column 3, lines 28-32 of Clouthier) by which said image raster data of each page is divided into tiles, each tile including a plurality of image raster data (column 5, lines 6-12 of Clouthier), a gray scale value is identified for each tile that contains only dither cells (column 5, lines 40-47 of Clouthier), and said tile is marked (column 5, lines 6-12 of Clouthier); and an apparatus (figure 1(22) of Clouthier) for transmitting characteristic data of the marked tiles for further processing of the image raster data (column 4, lines 57-62 and column 5, lines 1-4 of Clouthier), said characteristic data including information about a position of the respective tile (column 6, line 63 to column 7, line 1 of Clouthier) and a respective gray scale value (column 6, lines 12-17 of Clouthier). The tiles correspond to the sections of image data that are classified in one of four possible ways (column 4, lines 2-8 of Clouthier).

Clouthier does not disclose expressly that the gray scale values of said dither cells correspond to model dither cells; an appertaining model dither cell and said gray scale value thereof are identified for each tile that contains only dither cells; and that said transmitting is performed without transmitting raster image data of marked tiles.

Spaulding discloses determining the gray scale values of dither cells using model dither cells (figure 11(116A-C) and column 14, lines 32-39 of Spaulding); and identifying an appertaining model dither cell and a gray scale value thereof for each tile of dither cells (column 14, lines 36-45 of Spaulding).

Clouthier and Spaulding are combinable because they are from the same field of endeavor, namely selective processing, control and output of digital color image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the model dither cells to set the dither cells of each corresponding gray scale value for each tile of dithered image data, as taught by Spaulding, wherein said dither cells are the dither cells of the tiles specifically determined and marked by the system taught by Clouthier. The motivation for doing so would have been reduce image artifacts by using already optimized model dither cells stored in LUTs for dithering the image data (column 3, lines 28-35 of Spaulding). Further, it would have been readily recognized by one of ordinary skill in the art at the time of the invention that using already optimized dither cells stored in LUTs decreases the

Art Unit: 2625

overall processing time required. Therefore, it would have been obvious to combine Spaulding with Clouthier.

Clouthier in view of Spaulding does not disclose expressly that said transmitting is performed without transmitting raster image data of marked tiles.

Knox discloses transmitting characteristic data without transmitting image raster data (figure 6A (“MODEL PARAMETERS”); figure 6B (“EXPECTED TRC”); column 5, lines 20-30; and column 8, lines 3-11 of Knox). The characteristic data of the scanned image is determined and used to calibrate the printer. Only the characteristic data, such as the model parameters and tone reproduction curve (TRC), are transmitted in calibration mode. The image raster data itself is not transmitted.

Clouthier in view of Spaulding is combinable with Knox because they are from the same field of endeavor, namely the correction of digital image data. Furthermore, Knox is concerned with the same problem solving area as the present application, namely the correction of image data in an efficient manner, without require the transmission of the actual image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to correct image data by transmitting only the characteristic data needed to perform the correction/calibration, as taught by Knox, instead of the image raster data of said marked tiles taught by Clouthier. The motivation for doing so would have been to provide for an automatic correction/calibration using a single set of characterization data, rather than using the sets of image data (column 2, lines 39-41 of Knox), thus improving speed and efficiency. Therefore it would have been obvious to combine Knox with Spaulding in view of Clouthier to obtain the invention as specified in claims 75, 85 and 87.

Further regarding claim 85: The system of claim 75 embodies the computer program product of claim 85 and performs the associated steps performed by said computer program product.

Further regarding claim 87: The system of claim 75 embodies the computer program element of claim 87 and performs the associated steps performed by said computer program element.

Regarding claim 77: Clouthier discloses a polygon formed by combining neighboring tiles with predetermined gray scale value corresponding to a model dither cell (figure 2a(48) and column 6, line 63 to column 7, line 3 of Clouthier); and wherein said apparatus for transmitting transmits said characteristic data of said polygon for further processing of said image raster data (figure 2b and column 8, lines 25-35 of Clouthier).

Clouthier in view of Spaulding does not disclose expressly that said transmitting is performed instead of transmitting characteristic data of individual marked tiles of the polygon.

Art Unit: 2625

Knox discloses transmitting characteristic data of the overall image without transmitting data with respect to individual portions of the image (figure 6A ("MODEL PARAMETERS"); figure 6B("EXPECTED TRC"); column 5, lines 20-30; and column 8, lines 3-11 of Knox). The characteristic data of the scanned image is determined and used to calibrate the printer. Only the characteristic data relating to the entire image, such as the model parameters and tone reproduction curve (TRC), are transmitted in calibration mode. Data relating to individual units or portions of the image are not transmitted.

Clouthier in view of Spaulding is combinable with Knox because they are from the same field of endeavor, namely the correction of digital image data. Furthermore, Knox is concerned with the same problem solving area as the present application, namely the correction of image data, such as the polygon taught by Clouthier, in an efficient manner, without require the transmission of the actual image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to correct image data by transmitting only the characteristic data needed to perform the required processing, as taught by Knox. The motivation for doing so would have been to provide for an automatic processing using a single set of characterization data, rather than using data corresponding to portions of the image (column 2, lines 39-41 of Knox), thus improving speed and efficiency. Therefore it would have been obvious to combine Knox with Spaulding in view of Clouthier to obtain the invention as specified in claim 77.

Regarding claim 79: Clouthier discloses that said polygon is one of a square and a rectangle (figure 2b(52,54,56) and column 8, lines 12-17 of Clouthier).

Regarding claims 80 and 86: Clouthier discloses a computer program product comprising a computer-readable medium on which is stored a computer program having commands in encoded form, said computer program causing a computer to implement the following steps (column 3, lines 12-15 of Clouthier): generating a data stream of image raster data page-by-page (column 4, lines 9-14 of Clouthier) from language elements of a graphics language (column 3, lines 29-32 of Clouthier), said data stream containing gray picture elements in a form of dither cells (column 4, lines 2-8 of Clouthier); determining at least one area that contains only dither cells (column 4, lines 3-5 of Clouthier); identifying a gray scale value of said at least one area (column 5, lines 40-47 of Clouthier), and marking said at least one area (column 5, lines 6-12 of Clouthier); and transmitting characteristic data of said marked tiles for printing of the image raster data (column 4, line 57 to column 5, line 14 of Clouthier), said characteristic data containing information about a position of the respective tile (column 6, line 63 to column 7, line 1 of Clouthier) and the respective gray scale value (column 6, lines 12-17 of Clouthier). The tiles correspond

Art Unit: 2625

to the sections of image data that are classified in one of four possible ways (column 4, lines 2-8 of Clouthier).

Clouthier does not disclose expressly that the gray scale values of said dither cells correspond to model dither cells; identifying an appertaining model dither cell and said gray scale value of said at least one area; and that said transmitting is performed without transmitting the raster image data of said at least one area.

Spaulding discloses defining the gray scale values of dither cells using model dither cells (figure 11(116A-C) and column 14, lines 32-39 of Spaulding); and identifying an appertaining model dither cell and a gray scale value of at least one area of dither cells (column 14, lines 36-45 of Spaulding).

Clouthier and Spaulding are combinable because they are from the same field of endeavor, namely selective processing, control and output of digital color image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the model dither cells to set the dither cells of each corresponding gray scale value for each tile of dithered image data, as taught by Spaulding, wherein said dither cells are the dither cells of the tiles specifically defined and marked by the system taught by Clouthier. The motivation for doing so would have been reduce image artifacts by using already optimized model dither cells stored in LUTs for dithering the image data (column 3, lines 28-35 of Spaulding). Further, it would have been readily recognized by one of ordinary skill in the art at the time of the invention that using already optimized dither cells stored in LUTs decreases the overall processing time required. Therefore, it would have been obvious to combine Spaulding with Clouthier.

Clouthier in view of Spaulding does not disclose expressly that said transmitting is performed without transmitting the raster image data of said at least one area.

Knox discloses transmitting characteristic data without transmitting raster image data (figure 6A ("MODEL PARAMETERS"); figure 6B("EXPECTED TRC"); column 5, lines 20-30; and column 8, lines 3-11 of Knox). The characteristic data of the scanned image is determined and used to calibrate the printer. Only the characteristic data, such as the model parameters and tone reproduction curve (TRC), are transmitted in calibration mode. The raster image data itself is not transmitted.

Clouthier in view of Spaulding is combinable with Knox because they are from the same field of endeavor, namely the correction of digital image data. Furthermore, Knox is concerned with the same problem solving area as the present application, namely the correction of image data in an efficient manner, without require the transmission of the actual image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to correct image data by transmitting only the characteristic data needed to perform the correction/calibration, as taught by Knox, instead of the raster

Art Unit: 2625

image data of said at least one area taught by Clouthier. The motivation for doing so would have been to provide for an automatic correction/calibration using a single set of characterization data, rather than using the sets of image data (column 2, lines 39-41 of Knox), thus improving speed and efficiency. Therefore it would have been obvious to combine Knox with Spaulding in view of Clouthier to obtain the invention as specified in claims 80 and 86.

Further regarding claim 80: The method of claim 80 is performed by the computer program product of claim 86.

Regarding claims 76 and 81: Clouthier discloses that said dither cells contain picture elements that are arranged one of rectangularly and quadratically (figure 2b(52,54,56) and column 8, lines 60-62 of Clouthier); and that each dither cell with a higher gray scale value at least contains inked picture elements at same positions as a dither cell with a next-lower gray scale value (column 6, lines 33-37 of Clouthier).

Regarding claim 82: Clouthier discloses that said dither cells of a rectangular region (figure 2b(52,54,56) of Clouthier) have a common minimum gray scale value (column 6, lines 63-67 and column 7, lines 39-44 of Clouthier).

Regarding claim 83: Clouthier discloses producing a list of said rectangular regions (column 8, lines 25-30 of Clouthier); and transmitting said characteristic data of said rectangular regions of said list (column 8, lines 34-35 of Clouthier).

Regarding claim 88: Clouthier discloses that said computer program element is present on a computer-readable medium (column 3, lines 12-15 of Clouthier).

5. Claims 47-48 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), and Hiratsuka (US Patent 4,758,897):

Regarding claim 47: Clouthier in view of Spaulding and Knox does not disclose expressly comparing using a comparison row that contains only said model dither cells and whose length at least corresponds to said uniform row length of a tile so as to determine whether a tile contains dither cells at least with said lowest gray scale value corresponding to said model dither cell; and implementing said comparing step tile row by tile row.

Hiratsuka discloses comparing using a comparison row (figure 16A-16D and column 2, lines 55-57 of Hiratsuka) that contains only said model dither cells (column 9, lines 35-43 of Hiratsuka) and whose length at least corresponds to said uniform row length of a tile (figure 18; column 9, lines 53-59; and column 10, lines 63-65 of Hiratsuka) so as to determine whether a tile contains dither cells at least

Art Unit: 2625

with said lowest gray scale value corresponding to said model dither cell (figures 21A-21D and column 11, lines 53-60 of Hiratsuka); and implementing said comparing step tile row by tile row (column 9, line 67 to column 10, line 2 of Hiratsuka).

Clouthier in view of Spaulding and Knox is combinable with Hiratsuka because they are from the same field of endeavor, namely control and output of digital image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform tile row by tile row comparisons of model dither cells with the generated halftone data according to the teachings of Hiratsuka. The motivation for doing so would have been to effectively obtain representative gray scale values for predefined regions of the dithered image (column 1, lines 58-65 of Hiratsuka). Therefore, it would have been obvious to combine Hiratsuka with Clouthier in view of Spaulding and Knox to obtain the invention as specified in claim 47.

Further regarding claim 48: Hiratsuka discloses that the length of said comparison row amounts to the smallest common multiple of row length of a tile and row length of said dither cell (figures 21A-21D and column 10, lines 63-68 of Hiratsuka). Since row length of the tile and the row length of said dither cell are set to the same size in the comparison step (figures 21A-21D and column 10, lines 63-68 of Hiratsuka), then the length of said comparison row amounts to the smallest common multiple of row length of a tile and row length of said dither cell.

Further regarding claim 50: Hiratsuka discloses using said comparison row with the appertaining model dither cells for each gray scale value (column 9, lines 60-67 of Hiratsuka).

6. Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), Hiratsuka (US Patent 4,758,897), and Wong (US Patent 4,032,978).

Regarding claim 49: Clouthier discloses that the size of the picture element matrix of said dither cell can have one of several different sizes (column 6, lines 53-59 of Clouthier).

Clouthier in view of Spaulding, Knox and Hiratsuka does not disclose expressly that said dither cell has one of an 8x8 and 10x10 picture element matrix.

Wong discloses that said dither cell has one of an 8x8 and 10x10 picture element matrix (figure 11(G8,G10) and column 9, lines 37-43 of Wong).

Clouthier in view of Spaulding, Knox and Hiratsuka is combinable with Wong because they are from the same field of endeavor, namely control and output of digital image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use an 8x8 or a 10x10

Art Unit: 2625

picture element matrix for said dither cell, as taught by Wong. The motivation for doing so would have been to provide for either 64 or 100 possible gray scale values, thus increasing the number of available representable tones. Therefore, it would have been obvious to combine Wong with Clouthier in view of Spaulding, Knox and Hiratsuka to obtain the invention as specified in claim 49.

7. Claims 52, 57, 62, 71 and 78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), and Venkateswar (European Patent Application 0 774 858 A2).

Regarding claims 52, 57, 62 and 78: Clouthier in view of Spaulding and Knox does not disclose expressly transmitting said characteristic data in compressed form.

Venkateswar discloses transmitting characteristic data of a tiled image (column 2, lines 56-58 of Venkateswar) in compressed form (column 3, lines 13-19 of Venkateswar).

Clouthier in view of Spaulding and Knox is combinable with Venkateswar because they are from the same field of endeavor, namely control and output of digital image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to compress said characteristic data before transmitting, as taught by Venkateswar. The motivation for doing so would have been to reduce the bandwidth required for transmitting the data, and thus the data transmission time (column 2, lines 22-25 of Venkateswar). Therefore, it would have been obvious to combine Venkateswar with Clouthier in view of Spaulding and Knox to obtain the invention as specified in claims 52, 57, 62 and 78.

Regarding claim 71: Clouthier in view of Spaulding and Knox does not disclose expressly that said RIP module is a POSTSCRIPT converter module.

Venkateswar discloses a RIP module that is a POSTSCRIPT converter module (column 3, lines 20-22 of Venkateswar).

Clouthier in view of Spaulding and Knox is combinable with Venkateswar because they are from the same field of endeavor, namely control and output of digital image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a POSTSCRIPT converter module for said RIP module, as taught by Venkateswar. The suggestion for doing so would have been that POSTSCRIPT is one of many different types of useful page description languages available (column 3, lines 20-22 of Venkateswar). Therefore, it would have been obvious to combine Venkateswar with Clouthier in view of Spaulding to obtain the invention as specified in claim 71.

Art Unit: 2625

8. Claims 63, 65 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), and Endoh (US Patent 4,652,935).

Regarding claims 63 and 65: Clouthier discloses marking said rectangles that contain only dither cells to produce marked rectangles (column 5, lines 5-12 of Clouthier).

Clouthier in view of Spaulding and Knox does not disclose expressly removing said raster image data of said marked tiles from said data stream by subtraction; and compressing a remaining data stream according to a standardized compression method and transmitting remaining image raster data stream.

Endoh discloses removing model picture elements from said data stream by subtraction; and compressing a remaining data stream according to a standardized compression method (column 12, lines 37-43 and column 13, lines 8-13 of Endoh) and transmitting remaining data stream (column 13, lines 20-23 and lines 30-35 of Endoh). The run-length encoding is based on the extracted picture elements to be encoded (column 12, lines 37-43 of Endoh). The extracted picture elements are encoded into run-length codes (column 13, lines 8-13 of Endoh). Thus, the model picture elements are removed from the data stream by subtraction and the remaining data stream is compressed and transmitted.

Clouthier in view of Spaulding and Knox is combinable with Endoh because they are from the same field of endeavor, namely control and output of digital image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use run-length encoding, as taught by Endoh, for the tiles taught by Clouthier in view of Spaulding and Knox. The model (extracted) picture elements would therefore be the marked tiles taught by Clouthier in view of Spaulding and Knox. The motivation for doing so would have been to improve the overall transmission speed of the data. Therefore, it would have been obvious to combine Endoh with Clouthier in view of Spaulding and Knox to obtain the invention as specified in claims 63 and 65.

Further regarding claim 69: Endoh discloses recompiling a transmitted image raster data using an OR function (column 18, lines 1-32 of Endoh). Decoding occurs based on which one of a plurality of different procedures, which are listed in detail in column 18, lines 1-32 of Endoh, is used for the particular data portion currently being considered by the processor. Further, the mode selection and the status selection are set in controlling which decoding procedure is performed. Thus, an OR function is required in the decoding since one of a plurality of different encoding procedures must be determined.

Art Unit: 2625

9. Claims 64 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), Endoh (US Patent 4,652,935), and Brindle (US Patent 5,526,469).

Regarding claims 64 and 66: Clouthier in view of Spaulding, Knox and Endoh does not disclose expressly that said standardized compression method is a FAX G4 compression method.

Brindle discloses specifically using a FAX G4 compression method as said standardized compression method (column 3, lines 38-40 of Brindle).

Clouthier in view of Spaulding, Knox and Endoh is combinable with Brindle because they are from the same field of endeavor, namely the control and processing of digital print data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a FAX G4 compression method, as taught by Brindle. The suggestion for doing so would have been that the FAX G4 compression method is commonly used (column 3, lines 38-40 of Brindle), and would thus be widely supported. Therefore, it would have been obvious to combine Brindle with Clouthier in view of Spaulding, Knox and Endoh to obtain the invention as specified in claims 64 and 66.

10. Claims 67-68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), and Züfle (US Patent 5,940,584).

Regarding claims 67 and 68: Clouthier in view of Spaulding and Knox does not disclose expressly transmitting data of said marked tiles according to an SPDS data format.

Züfle discloses transmitting print data according to an SPDS data format (column 3, lines 52-58 of Züfle).

Clouthier in view of Spaulding and Knox is combinable with Züfle because they are from the same field of endeavor, namely the control and processing of digital print data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to specifically use a SPDS data format for print data transmission, as taught by Züfle, for the marked tiles taught by Clouthier in view of Spaulding and Knox. The motivation for doing so would have been that SPDS format can be used to reliably send printing data to an archival filing system without needing to be directly printed first (column 3, lines 49-56 of Züfle). Thus, the marked tiles taught by Clouthier in view of Spaulding and Knox could be sent directly to memory from which they could be accessed for use by the printing system for printing each gray scale value in the desired fashion according to said marked tiles. Therefore, it

Art Unit: 2625

would have been obvious to combine Züfle with Clouthier in view of Spaulding and Knox to obtain the invention as specified in claims 67 and 68.

11. Claims 73-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), Venkateswar (European Patent Application 0 774 858 A2), and Applicant's admitted prior art.

Regarding claims 73-74: Clouthier in view of Spaulding, Knox and Venkateswar does not disclose expressly that said printer is a high-performance printer that has a printing output of at least 400 DIN A4 pages per minute at 600 DPI.

However, on page 2, lines 2-6 of the present specification, Applicant specifically states "The following example makes this clear: A DIN A4 page contains approximately 4.3 megabytes of image raster data given a pixel density of 600 dpi (dots per inch). A high-performance printer has the capability of printing more than 400 DIN A4 pages per minute at 600 dpi. Accordingly, a data rate of more than 28 megabytes/s would have to be governed without compression." Thus, Applicant clearly demonstrates that a high-performance printer that has a printing output of at least 400 DIN A4 pages per minute at 600 DPI is old, well-known and expected in the art. One of ordinary skill in the art at the time of the invention would have been motivated to use said high performance printer since said high performance printer can print at a fast pace, thus completing printing tasks quickly.

12. Claim 84 is rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451), Knox (US Patent 5,649,073), and well-known prior art.

Regarding claim 84: Clouthier in view of Spaulding does not disclose expressly transmitting said characteristic data in compressed form without transmitting and compressing raster image data of said rectangular regions.

Knox discloses transmitting characteristic data without transmitting image raster data of said rectangular regions (figure 6A ("MODEL PARAMETERS"); figure 6B("EXPECTED TRC"); column 5, lines 20-30; and column 8, lines 3-11 of Knox). The characteristic data of the scanned image is determined and used to calibrate the printer. Only the characteristic data, such as the model parameters and tone reproduction curve (TRC), are transmitted in calibration mode. The image raster data itself is not transmitted.

Clouthier in view of Spaulding is combinable with Knox because they are from the same field of endeavor, namely the correction of digital image data. Furthermore, Knox is concerned with the same problem solving area as the present application, namely the correction of image data in an efficient manner, without require the transmission of the actual image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to correct image data by transmitting only the characteristic data needed to perform the correction/calibration, as taught by Knox, instead of the image raster data of said marked tiles taught by Clouthier. The motivation for doing so would have been to provide for an automatic correction/calibration using a single set of characterization data, rather than using the sets of image data (column 2, lines 39-41 of Knox), thus improving speed and efficiency. Therefore it would have been obvious to combine Knox with Spaulding in view of Clouthier.

Spaulding in view of Clouthier and Knox does not disclose expressly that said characteristic data is transmitted in compressed form without compressing raster image data of said rectangular regions.

Official Notice is taken that transmitting data in compressed form is old, well-known and expected in the art. At the time of the invention, one of ordinary skill in the art would have been motivated to transmit said characteristic data in compressed form since compressed data transmits faster due to the smaller number of bits that need to be transmitted. Since, according to the teachings of Knox, the raster image data of said rectangular regions is not transmitted, said raster image data would also not be compressed since transmission is not required.

13. Claims 89-92 are rejected under 35 U.S.C. 103(a) as being unpatentable over Clouthier (US Patent 5,949,964) in view of Spaulding (US Patent 5,822,451).

Regarding claims 89 and 92: Clouthier discloses a computer-readable medium that contains a computer program on the computer-readable medium which causes a computer to implement the steps of (column 3, lines 12-15 of Clouthier) generating a data stream of image raster data page-by-page (column 4, lines 9-14 of Clouthier) from language elements of a graphics language (column 3, lines 29-32 of Clouthier), said data stream containing gray picture elements in a form of dither cells (column 4, lines 2-8 of Clouthier); determining at least one area that contains only dither cells (column 4, lines 3-5 of Clouthier); identifying a gray scale value of said at least one area (column 5, lines 40-47 of Clouthier), and marking said at least one area (column 5, lines 6-12 of Clouthier); and transmitting characteristic data of said marked tiles for further processing of the image raster data (column 4, lines 57-62 and column 5, lines 1-4 of Clouthier), said characteristic data containing information about a position of the respective tile (column 6, line 63 to column 7, line 1 of Clouthier) and the respective gray scale value (column 6,

Art Unit: 2625

lines 12-17 of Clouthier). The tiles correspond to the sections of image data that are classified in one of four possible ways (column 4, lines 2-8 of Clouthier).

Clouthier does not disclose expressly that the gray scale values of said dither cells are defined by model dither cells; and identifying an appertaining model dither cell and said gray scale value of said at least one area.

Spaulding discloses defining the gray scale values of dither cells using model dither cells (figure 11(116A-C) and column 14, lines 32-39 of Spaulding); and identifying an appertaining model dither cell and a gray scale value of at least one area of dither cells (column 14, lines 36-45 of Spaulding).

Clouthier and Spaulding are combinable because they are from the same field of endeavor, namely selective processing, control and output of digital color image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the model dither cells to set the dither cells of each corresponding gray scale value for each tile of dithered image data, as taught by Spaulding, wherein said dither cells are the dither cells of the tiles specifically defined and marked by the system taught by Clouthier. The motivation for doing so would have been reduce image artifacts by using already optimized model dither cells stored in LUTs for dithering the image data (column 3, lines 28-35 of Spaulding). Further, it would have been readily recognized by one of ordinary skill in the art at the time of the invention that using already optimized dither cells stored in LUTs decreases the overall processing time required. Therefore, it would have been obvious to combine Spaulding with Clouthier to obtain the invention as specified in claims 89 and 92.

Further regarding claim 89: The computer program element of claim 89 is fully embodied on the computer-readable medium of claim 92.

Regarding claim 90: Clouthier discloses that said computer program element is present on a computer-readable medium (column 3, lines 12-15 of Clouthier).

Regarding claim 91: Clouthier discloses a computer-readable medium that contains a computer program, comprising: the computer program on the computer-readable medium which causes a computer to implement the following steps (column 3, lines 12-15 of Clouthier): generating a data stream of image raster data (column 4, lines 9-14 of Clouthier) from language elements of a graphics language (column 3, lines 29-32 of Clouthier), said data stream containing gray image areas in a form of dither cells (column 4, lines 2-8 of Clouthier); dividing said image raster data of each one of said page into tiles of a two-dimensional grid network (figure 1(14) and column 3, lines 28-32 of Clouthier), each of said tiles including a plurality of said image raster data (column 5, lines 6-12 of Clouthier), identifying appertaining ones of dither cells and said gray scale values for each of said tiles that contains only dither cells (column

Art Unit: 2625

5, lines 40-47 of Clouthier) to produce marked tile (column 5, lines 6-12 of Clouthier); and transmitting characteristic data of the marked tiles for further processing of said image raster data (column 4, lines 57-62 and column 5, lines 1-4 of Clouthier), said characteristic data including information about a position of a respective one of said tiles (column 6, line 63 to column 7, line 1 of Clouthier) and a respective one of said gray scale values (column 6, lines 12-17 of Clouthier). The tiles correspond to the sections of image data that are classified in one of four possible ways (column 4, lines 2-8 of Clouthier).

Clouthier does not disclose expressly that the gray scale values of said dither cells are determined by model dither cells; and an appertaining model dither cell and said gray scale value thereof are identified for each tile that contains only dither cells.

Spaulding discloses determining the gray scale values of dither cells using model dither cells (figure 11(116A-C) and column 14, lines 32-39 of Spaulding); and identifying an appertaining model dither cell and a gray scale value thereof for each tile of dither cells (column 14, lines 36-45 of Spaulding).

Clouthier and Spaulding are combinable because they are from the same field of endeavor, namely selective processing, control and output of digital color image dither data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the model dither cells to set the dither cells of each corresponding gray scale value for each tile of dithered image data, as taught by Spaulding, wherein said dither cells are the dither cells of the tiles specifically determined and marked by the system taught by Clouthier. The motivation for doing so would have been reduce image artifacts by using already optimized model dither cells stored in LUTs for dithering the image data (column 3, lines 28-35 of Spaulding). Further, it would have been readily recognized by one of ordinary skill in the art at the time of the invention that using already optimized dither cells stored in LUTs decreases the overall processing time required. Therefore, it would have been obvious to combine Spaulding with Clouthier to obtain the invention as specified in claim 91.

Conclusion

14. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action

Art Unit: 2625

is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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